WESTERN U.S. WATER PLAN

LAND RESOURCE BASE

Working Document

June 1973

PREFACE

The Land Resources Task Force was established in the Management Group for the Western U.S. Water Plan Study to address the following components of the land base data pertinent to the study:

1. Inventory of land resources.
2. Determination of suitability of land resources for contributing to multiple objective planning.
3. Determination of availability of land resources.
4. Identifying land resource problems or needs.
5. Determining response of land base to alternative development, management and use programs or policies.

The following procedures were adopted by the task force to accomplish the above stated objectives.

1. Determine the land resource base for study, consistent with the report format established by the Management Group.
2. Develop procedures to obtain the required data.
3. Set time schedules and assign responsibilities for completion by scheduled dates.
4. Review compilations and related reports, approve or modify where necessary.
5. Prepare and submit progress reports on an interim basis -- report to include results, problems and proposed solutions.

Initial compilation of land resource data from Type 1 framework studies was assigned to USDA for the following categories of information:

1. Land ownership.
2. Surface cover.
3. Selected uses.
4. Some land-water relationships.

These data were initially inventoried during the last quarter of calendar 1971. The Land Resources Task Force (1) reviewed the submitted data, (2) determined what gaps needed to be filled in and what additional data were required to complete inventoried categories, and (3) assigned responsibility to agencies for completing certain portions of the inventory.

Departments and agencies were requested to inventory various aspects of ownership, cover, and use as follows:

USDA - complete ownership according to prescribed format.
USDA - complete surface cover for cropland, range and grassland, forest, alpine, other, urban and built-up, and water categories.

BOR - BSFW - recommend environmental data required.
BOR - GS - determine need for and availability of data on bodies of water by size categories.
SCS with BLM assisting - determinine data on water areas under 40 acres in size.
BSFW - BOR - explore estuaries as related to surface cover.
BOR - BSFW with FS and BLM cooperating - develop the data for recreational, scenic and wild rivers.
USDA - complete selected uses for food, fiber and wood products.
BM - complete selected uses for mineral extraction.
BSFW with Environmental Committee cooperating - determine fish and wildlife habitat.

Part one of this report is in response to those items assigned to USDA. There are other assignments listed above that have not been completed, but may be completed during the year. Because of curtailment of funds and the rescoping of the Westwide Study, it will be impossible for all of the reports to be completed. When additional reports are completed, they will be released as other "Parts" to this report.

WESTERN U.S. WATER PLAN

LAND RESOURCE BASE

PART I - OWNERSHIP, COVER AND SELECTED USES

Prepared By
UNITED STATES DEPARTMENT OF AGRICULTURE
Economic Research Service
Forest Service
Soil Conservation Service

for the

Land Resources Task Force
of the
Westwide Management Group

May 1973

LAND RESOURCE BASE

The Westwide Study Area is comprised of all or parts of nine hydrologic regions lying within the 11 states west of or through which passes the Continental Divide. These states comprise 40 percent of the contiguous United States land and water area.

FIGURE 1

Westwide Area in Contiguous United States

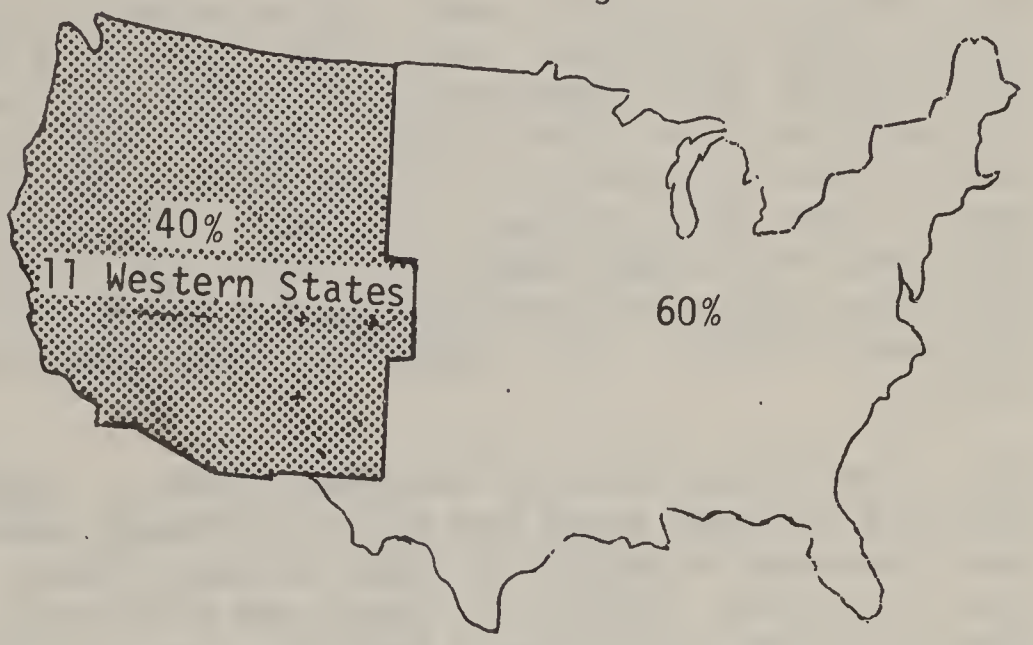

TABLE 1

LAND AND WATER AREA
(1,000 acres)

States Study Area & Nation	From Statistical Abstract Total Area	Westwide Land	Westwide Water*	Westwide Total Area
Arizona	72,902	72,675	227	72,902
California	101,564	100,207	1,357	101,564
Colorado	66,718	66,390	328	66,718
Idaho	53,476	52,877	600	53,477
Montana	94,168	93,258	1,124	94,382
Nevada	70,746	70,314	432	70,746
New Mexico	77,866	77,713	153	77,866
Oregon	62,068	61,355	749	62,104
Utah	54,346	52,693	1,659	54,352
Washington	43,643	42,542	818	43,361
Wyoming	62,665	62,101	561	62,662
Westwide	760,162	752,125	8,008	760,133
Contig. U.S.	1,934,246			
Total U. S.	2,313,679			

*Includes bodies of water under 40 acres in size.

Land and water resources are closely related. Use, development and management of land affect the quality and quantity of water. In turn, development of the water resource affects the availability, productivity, and use of the land. The widely diverse climate, geology, physiography, and soils in the western states have influenced the nature of land resources, their use, development, management and ownership.

The ownership, surface cover, and selected uses acreages are shown by state within hydrologic regions in Tables 2, 3 and 5, respectively. The acreages were assembled by USDA with assistance and concurrence of the Westwide State Study Teams. The six Type 1 River Basin Comprehensive Studies were primary data sources for nearly 89 percent of the area. Other data sources* included: Conservation Needs Inventory, USGS Area Measurement Reports, Statistical Abstract, National Atlas of the United States of America, Types 2 and 4 River Basin Studies; State Engineer's Office, and a number of other commission, state and agency reports.

Few satisfactory attempts have been made to reconcile independently measured drainage areas and political areas. Minor area adjustments were sometimes necessary to make acreage figures coincide. Boundaries used in various studies are sometimes different. The Nevada State Study Team has asked to include 3,154,000 acres of closed drains reported in the Lower Colorado Framework with the Great Basin Region. The California-Great Basin hydrologic boundary weaves back and forth across the California-Nevada State line; the regional boundary was arbitrarily placed on the State line. The acres in southeast Oregon that drain into the Great Basin are reported in the Columbia-North Pacific. Hudson Bay and other headwaters draining into Canada are included in the Missouri Region. Westwide regional boundaries are shown in Figure 2.

Land resource base shown is derived from 1965 data. Framework studies used 1965 as their base year. The base was updated in some instances to reflect refined, more complete, and newer data generated since framework studies. In others, even though later data were available, the 1965 data were used to be consistent.

Gross acreages of public-private land ownership have not substantially changed in the past eight years. Although the magnitude has not been documented, land cover and use changes are occurring. Urban and built-up land is increasing at the expense of irrigated cropland, range and forest land. Irrigated cropland is increasing at the expense of dry land and range acreages. Water areas have increased about a half million acres in the last ten years. The changes since 1965 were not believed to be large enough to warrant an updating effort. The land resource data are acceptable for users of Type 1 level information.

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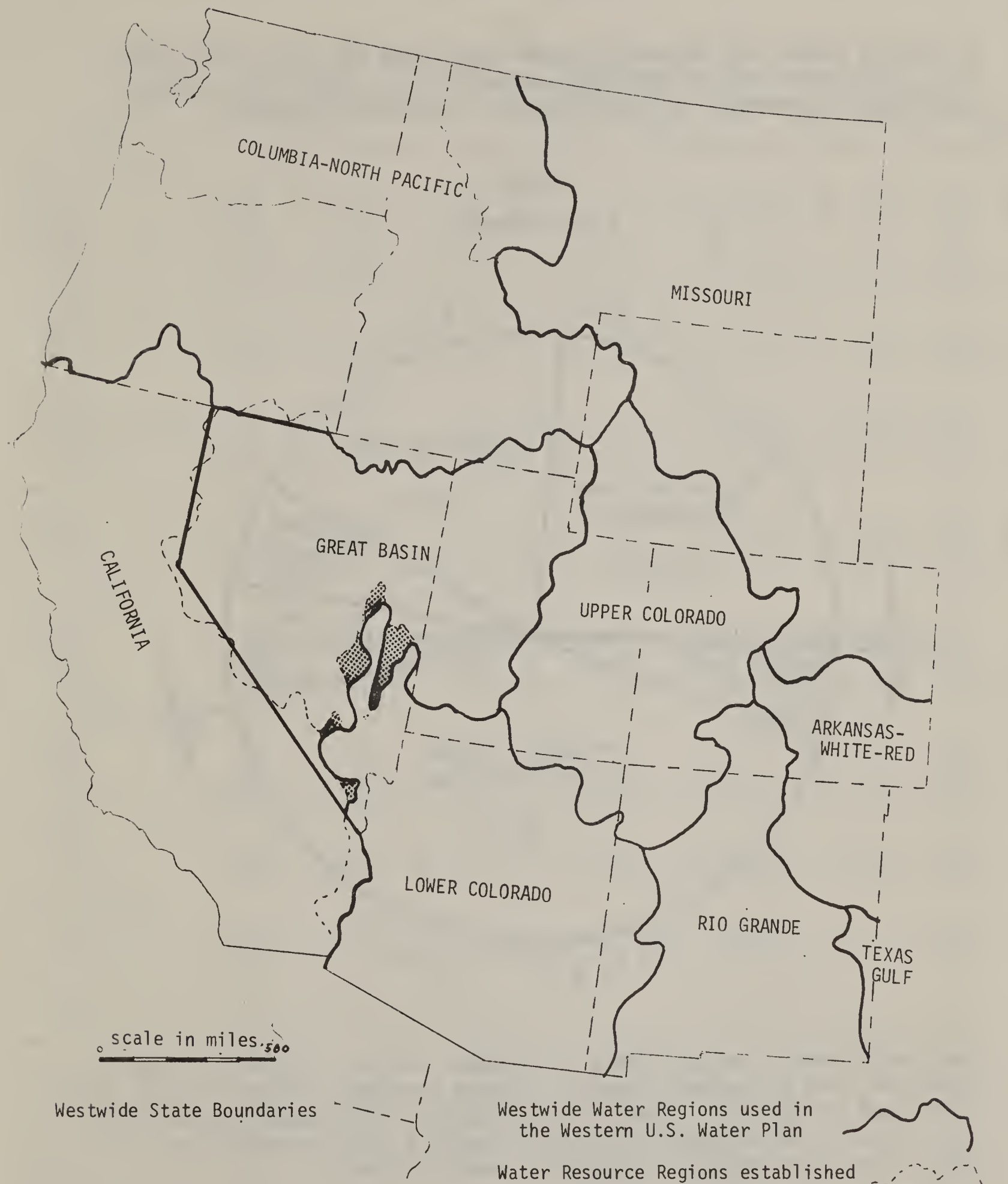
*For complete data sources, see page 19.

FIGURE 2

WESTWIDE WATER REGIONS

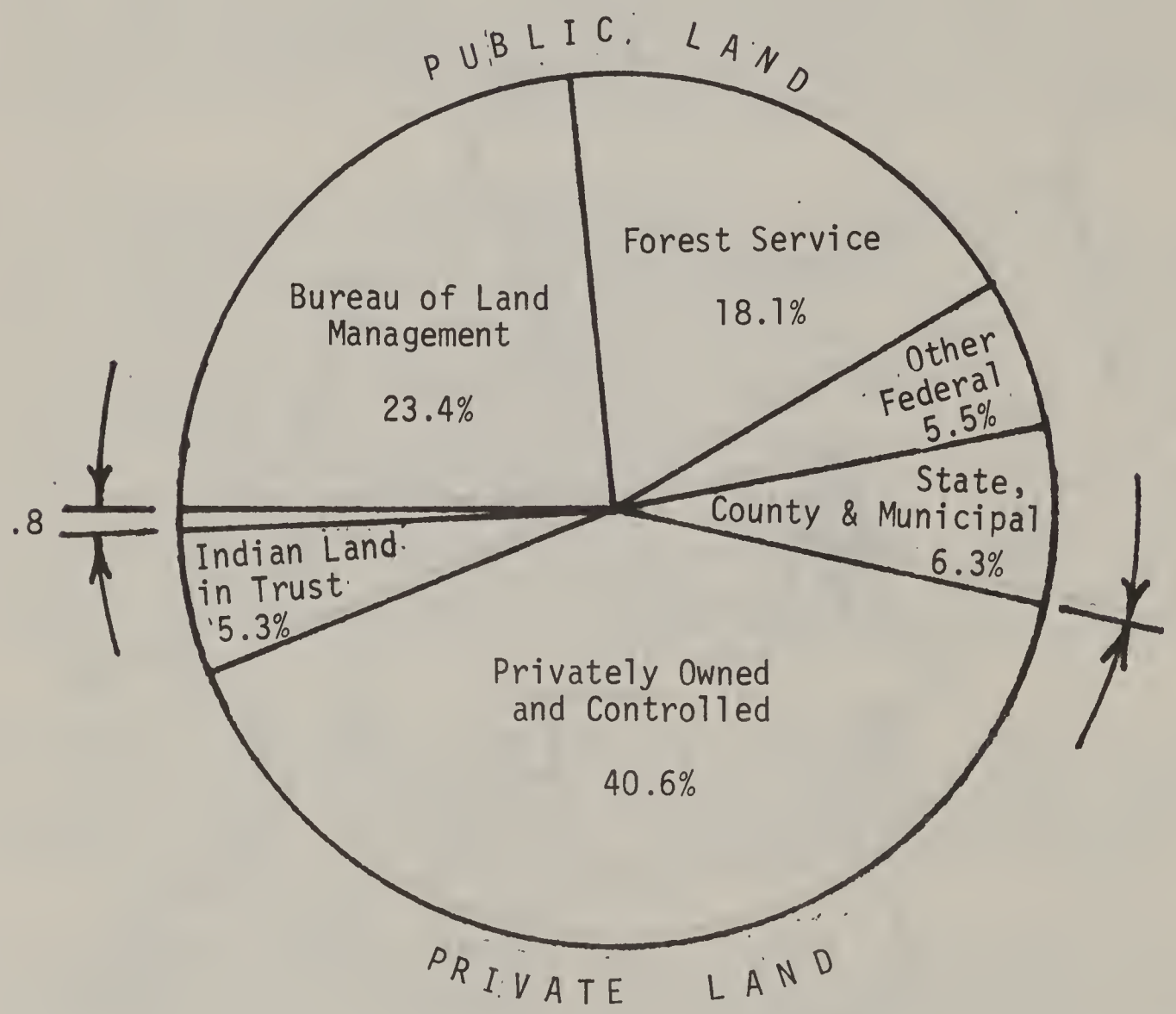


LAND OWNERSHIP

Privately owned and federally owned land areas are nearly the same; i.e., 46 percent and 47 percent, respectively. Municipal, county, and state governments own seven percent of Westwide lands.

FIGURE 3

LAND OWNERSHIP



Tract withdrawals and transfers of titles, leases, control and administration, and management prevent precise acreages without further definition and inventory. Although reporting may be somewhat non-uniform, the ownership and/or administration responsibility acreages shown in Table 2 are sufficiently refined for Level B studies.

Unaccounted for water surfaces and land areas are listed as unclassified. When public, private, and unclassified land and water areas are summed, they equal the "Total Land and Water Areas" in the last column of Table 3.

TABLE 2

WESTWIDE LAND AND WATER OWNERSHIP BY REGION BY STATE

(1,000 acres)

Region and State	Public Lands												Private Lands		
	USDA		BLM	BSFW	NPS	BR	Other Interior	Dept. of Def.	Other Fed'l Lands	Total Federal	State	County and Municipal*	Indian Land in Trust	Privately Owned Land	Unclassified Land and Water
	FS	Other Agr.													
COLUMBIA-NORTH PACIFIC															
Washington	9,016	1	275	110	1,903	393	7	504	381	12,590	3,316	390	2,508	23,872	685
Oregon	13,867	15	15,313	433	64	161	3	149	3	30,008	1,710	421	690	24,732	394
Idaho	19,790	33	11,839	20	85	582	-	94	575	33,018	2,746	145	831	14,045	521
Montana	8,737	-	152	20	656	-	-	-	1	9,566	646	10	619	5,081	175
Wyoming	2,226	-	13	25	686	-	-	-	-	2,950	9	-	-	288	-
Nevada	676	-	1,870	--	-	-	-	-	-	2,546	-	-	144	605	4
Utah	47	-	52	-	-	-	-	-	-	99	26	-	-	116	-
TOTAL	54,359	49	29,514	608	3,394	1,136	10	747	960	90,777	8,453	966	4,792	68,739	1,779
CALIFORNIA															
California	19,880	1	16,816	51	4,113	218	-	3,035	25	44,139	1,953	1,939	543	51,633	1,357
Oregon	1,641	-	278	30	97	5	-	7	-	2,058	10	-	142	1,802	137
TOTAL	21,521	1	17,094	81	4,210	223	-	3,042	25	46,197	1,963	1,939	685	53,435	1,494
MISSOURI															
Montana (incl. Hudson Bay)	7,872	56	7,999	117	444	269	122	7	609	17,495	71	-	4,584	55,921	214
Wyoming	5,150	-	9,360	12	1,584	600	2	19	-	16,727	3,733	-	1,887	22,627	-
Colorado	2,509	15	298	-	166	18	-	82	-	3,088	1,061	194	-	14,706	-
TOTAL	15,531	71	17,657	129	2,194	887	124	108	609	37,310	4,865	194	6,471	93,254	214
GREAT BASIN															
Idaho	490	-	399	-	-	-	-	-	-	889	57	-	-	1,182	43
Wyoming	173	-	410	-	-	-	-	-	-	583	84	-	-	302	-
Nevada	4,286	-	40,920	1,619	117	386	-	3,444	2	50,774	43	26	888	7,512	280
Utah	3,980	-	10,637	88	17	32	-	1,847	-	16,602	1,538	-	62	8,398	1,420
TOTAL	8,929	-	52,366	1,707	134	418	-	5,291	2	68,848	1,722	26	950	17,394	1,743
UPPER COLORADO															
Wyoming	1,140	-	7,929	12	-	45	-	-	-	9,126	958	-	-	3,388	-
Utah	3,616	-	12,656	10	410	83	-	59	-	16,834	1,864	2,890	2,060	-	203
Arizona	6	-	261	-	84	-	-	-	-	351	22	12	4,036	-	13
Colorado	8,410	-	6,840	1	340	26	1	55	26	15,699	465	77	755	7,589	82
New Mexico	142	-	1,524	-	22	4	-	-	9	1,701	283	21	3,706	523	-
TOTAL	13,314	-	29,210	23	856	158	1	114	35	43,711	3,592	3,000	10,557	11,500	298
LOWER COLORADO															
Nevada	147	-	5,586	753	300	213	-	314	1	7,314	57	5	5	410	133
Utah	289	-	1,115	-	-	-	-	-	-	1,404	137	-	-	554	145
Arizona	11,525	-	11,943	772	2,344	364	-	3,544	86	30,578	9,308	25	15,320	13,036	201
New Mexico	2,837	-	1,370	-	1	-	-	22	12	4,242	874	39	1,118	2,274	-
TOTAL	14,798	-	20,014	1,525	2,645	577	-	3,880	99	43,538	10,376	69	16,443	16,274	479
RIO GRANDE															
Colorado	1,800	-	516	-	37	-	24	-	-	2,377	205	21	-	2,211	3
New Mexico	5,944	-	10,597	144	217	176	-	2,758	233	20,069	6,173	526	2,525	18,938	-
TOTAL	7,744	-	11,113	144	254	176	24	2,758	233	22,446	6,378	547	2,525	21,149	3
ARKANSAS-WHITE-RED															
Colorado	1,402	-	643	-	-	-	-	97	344	2,486	1,361	-	-	14,305	33
New Mexico	195	-	72	2	1	8	-	-	8	286	1,443	78	-	9,535	-
TOTAL	1,597	-	715	2	1	8	-	97	352	2,772	2,804	78	-	23,840	33
TEXAS GULF															
New Mexico	-	-	51	-	-	-	-	3	1	55	640	75	-	2,742	-
WESTWIDE TOTAL	137,793	121	177,734	4,219	13,688	3,583	159	16,040	2,316	355,654	40,793	6,894	42,423	308,327	6,043
ARIZONA	11,531	-	12,204	772	2,428	364	-	3,544	86	30,929	9,330	37	19,356	13,036	214
CALIFORNIA	19,880	1	16,816	51	4,113	218	-	3,035	25	44,139	1,953	1,939	543	51,633	1,357
COLORADO	14,121	15	8,297	1	543	44	25	234	370	23,650	3,092	292	755	38,811	118
IDAHO	20,280	33	12,238	20	85	582	-	94	575	33,907	2,803	145	831	15,227	564
MONTANA	16,609	56	8,151	137	1,100	269	122	7	610	27,061	717	10	5,203	61,002	389
NEVADA	5,109	-	48,376	2,372	417	599	-	3,758	3	60,634	100	31	1,037	8,527	417
NEW MEXICO	9,118	-	13,614	146	241	188	-	2,783	263	26,353	9,413	739	7,349	34,012	-
OREGON	15,508	15	15,591	463	161	166	3	156	3	32,066	1,720	421	832	26,534	531
UTAH	7,932	-	24,460	98	427	115	-	1,906	-	34,939	3,565	2,890	2,122	9,068	1,768
WASHINGTON	9,016	1	275	110	1,903	393	7	504	381	12,590	3,316	390	2,508	23,872	685
WYOMING	8,689	-	17,712	49	2,270	645	2	19	-	29,386	4,784	-	1,887	26,605	-

*County and municipal ownership is not available in some states; these acreages are included with private lands.
Base Year 1965 - See text.

Acreages sum to Total Land and Water Areas in Table 3.

(May 1973)

Private Lands

The 350,751,000 acres of private land are scattered throughout Westwide, generally in the plains and fertile valleys where water exists. The 66,205,000 acres or 70 percent of Montana and 52,176,000 acres of California that are in private ownership contrast with the 11,190,000 acres of Utah and 9,564,000 or 14 percent of Nevada as privately owned land.

The United States Government holds 50 million acres in the contiguous U.S. in trust for the Indians. The 19.4 million acres in Arizona, 7.3 in New Mexico, 5.2 in Montana, and 10.5 million acres in the other eight Western States comprise 12 percent of Westwide privately owned sectors. The 42.4 million acres in 168 western reservations, colonies, rancherias, or pueblos are managed to provide income and to maintain the Indians' culture.

The management of 308.3 million acres of privately owned and controlled land is vested with thousands of individuals, corporations, and legal entities. Except for some general restrictions such as taxes and zoning laws, these individual owners and managers traditionally have had the right to use the land much as they saw fit. The use and management of private land is basically for monetary gain. Thus, the broad patterns of livestock raising, cropping, timber, industry, mining and urbanization in the private sector generally represent economic use of the land.

Public Lands

Municipal, county, and state governments manage nearly 7 million acres to provide public services and amenities for those people within their jurisdictional boundaries.

The 355,654,000 acres of federally owned land are predominant in the mountainous and arid basins. Federal lands range from 29 percent in Montana and in Washington to 86 percent in Nevada and averages 47 percent in the Westwide Study area.

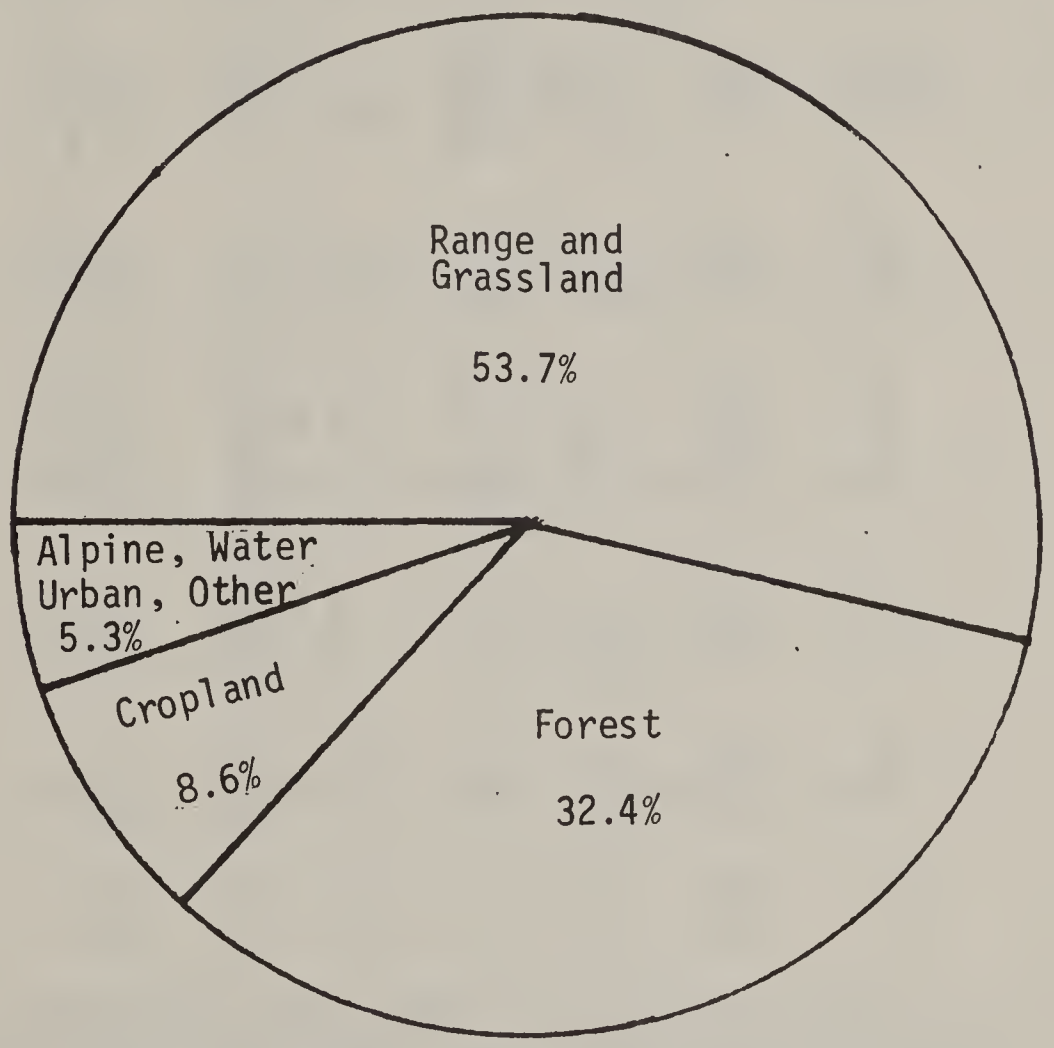
The Bureau of Land Management and the Forest Service are the largest federal land management agencies in the basin. Together, they manage nearly 315.5 million acres. As directed by Congress, these lands are managed for the wise use of outdoor recreation, range, timber, watershed and fish and wildlife habitat. Legislation recognizes the multiple purpose values of such lands and currently they are managed to achieve maximum multiple use. Certain areas of remaining wilderness and areas possessing unique features have been designated as "wilderness" or "primitive" areas. The National Park Service administers 13.7 million acres of public land in Westwide. These lands are managed to preserve natural, scenic, historic, or recreational values. The Bureau of Sport Fisheries and Wildlife manages 4.2 million acres of land to perpetuate and produce fish and wildlife for enjoyment and use. The 16 million acres managed by the Department of Defense, 3.6 million by the Bureau of Reclamation and 2.6 million by other federal agencies are principally functional lands acquired for specific public purposes.

SURFACE COVER

Land covers 752.1 million acres and water covers 8.0 million acres of the Westwide surface areas. The land area is categorized as Cropland, Range and Grassland, Forest, Alpine, Other and Urban.

FIGURE 4

SURFACE COVER



The landscape is composed of the visual manifestation of man superimposed upon the dominant and enduring landform. Man appears to alter the landscape in two basic ways: 1) through the manipulation of the natural resources in such activities as farming, mineral extraction, and forest management, and 2) through the introduction of structures as buildings, roads, etc. Patterns are created as a result of the kind and extent of man's manipulation.

TABLE 3

WESTWIOE SURFACE COVER BY REGION BY STATE

(1,000 acres)

Region and State	Cropland	Range and Grassland	Forest	Alpine	Other	Urban	Total Land Area	Water Area Under 40	Water Area Over 40	Total Land and Water Area
COLUMBIA-NORTH PACIFIC										
Washington	8,304	8,522	22,970	850	950	946	42,542	133	686	43,361
Oregon	5,348	22,522	27,480	170	1,107	731	57,358	203	394	57,955
Idaho	5,989	21,999	20,901	375	1,303	182	50,749	37	520	51,306
Montana	252	1,961	12,708	294	457	118	15,790	52	255	16,097
Wyoming	88	1,138	1,653	260	25	11	3,175	15	57	3,247
Nevada	7	3,167	106	-	12	1	3,293	2	4	3,299
Utah	8	204	26	-	3	-	241	-	-	241
TOTAL	19,996	59,513	85,844	1,949	3,857	1,989	173,148	442	1,916	175,506
CALIFORNIA										
California	11,910	39,552	43,580	-	2,835	2,330	100,207	201	1,156	101,564
Oregon	352	741	2,815	-	69	20	3,997	13	139	4,149
TOTAL	12,262	40,293	46,395	-	2,904	2,350	104,204	214	1,295	105,713
MISSOURI										
Montana (incl. Hudson Bay)	12,377	52,000	9,773	580	1,126	1,612	77,468	146	671	78,285
Wyoming	2,092	34,191	6,839	1,400	-	68	44,590	74	310	44,974
Colorado	6,385	7,857	3,397	200	633	451	18,923	21	105	19,049
TOTAL	20,854	94,048	20,009	2,180	1,759	2,131	140,981	241	1,086	142,308
GREAT BASIN										
Idaho	627	1,123	340	-	29	9	2,128	3	40	2,171
Wyoming	49	769	142	-	-	4	964	2	3	969
Nevada	275	48,462	8,484	100	1,741	169	59,231	12	280	59,523
Utah	1,696	12,728	8,712	164	3,298	2	26,600	4	1,416	28,020
TOTAL	2,647	63,082	17,678	264	5,068	184	88,923	21	1,739	90,683
UPPER COLORAOO										
Wyoming	183	11,578	1,143	196	187	85	13,372	18	82	13,472
Utah	555	11,646	9,668	85	1,584	80	23,618	30	203	23,851
Arizona	11	3,131	845	-	412	19	4,418	3	13	4,434
Colorado	931	7,730	13,954	1,048	717	164	24,544	37	86	24,667
New Mexico	37	4,688	1,437	-	35	21	6,218	-	16	6,234
TOTAL	1,717	38,773	27,047	1,329	2,935	369	72,170	88	400	72,658
LOWER COLORAOO										
Nevada	18	5,559	2,014	-	99	100	7,790	1	133	7,924
Utah	24	923	1,257	-	26	4	2,234	4	2	2,240
Arizona	1,643	44,676	21,491	10	34	403	68,257	10	201	68,468
New Mexico	72	4,334	4,054	1	32	39	8,532	-	15	8,547
TOTAL	1,757	55,492	28,816	11	191	546	86,813	15	351	87,179
RIO GRANOE										
Colorado	194	1,656	2,221	100	583	48	4,802	3	12	4,817
New Mexico	763	34,397	12,156	30	268	525	48,139	1	91	48,231
TOTAL	957	36,053	14,377	130	851	573	52,941	4	103	53,048
ARKANSAS-WHITE-REO										
Colorado	3,359	9,893	3,424	80	1,112	253	18,121	11	53	18,185
New Mexico	654	8,205	2,300	8	71	78	11,316	1	25	11,342
TOTAL	4,013	18,098	5,724	88	1,183	331	29,437	12	78	29,527
TEXAS GULF										
New Mexico	926	2,472	-	-	34	76	3,508	-	4	3,512
WESTWIDE TOTAL	65,129	407,824	245,890	5,951	18,782	8,549	752,125	1,037	6,972	760,134
ARIZONA	1,654	47,807	22,336	10	446	422	72,675	13	214	72,902
CALIFORNIA	11,910	39,552	43,580	-	2,835	2,330	100,207	201	1,156	101,564
COLORAOO	10,869	27,136	22,996	1,428	3,045	916	66,390	72	256	66,718
IOAHO	6,616	23,122	21,241	375	1,332	191	52,877	40	560	53,477
MONTANA	12,629	53,961	22,481	874	1,583	1,730	93,258	198	926	94,382
NEVADA	300	57,188	10,604	100	1,852	270	70,314	15	417	70,746
NEW MEXICO	2,452	54,096	19,947	39	440	739	77,713	2	151	77,866
OREGON	5,700	23,263	30,295	170	1,176	751	61,355	216	533	62,104
UTAH	2,283	25,501	19,663	249	4,911	86	52,693	38	1,621	54,352
WASHINGTON	8,304	8,522	22,970	850	950	946	42,542	133	686	43,361
WYOMING	2,412	47,676	9,777	1,856	212	168	62,101	109	452	62,662

Base Year 1965 - See text.

(May 1973)

The cover categories, the apparent presence or absence of each, their dominance in terms of percent of area covered and their distribution throughout the landscape are the primary determinants of landscape patterns. The acreages of the water and land categories are shown by region by state in Table 3. The percent of the surface cover categories within each of the 11 Western States is shown in Table 4.

TABLE 4

PERCENT OF SURFACE COVER WITHIN STATES

Surface	Cropland	Range and Grassland	Forest	Alpine	Other	Urban	Water	Total
ARIZONA	2.3	65.6	30.6	.01	.6	.6	.3	100.0
CALIFORNIA	11.7	39.0	42.9	-	2.8	2.3	1.3	100.0
COLORADO	16.3	40.7	34.5	2.1	4.6	1.4	.4	100.0
IDAHO	12.4	43.2	39.7	.7	2.5	.4	1.1	100.0
MONTANA	13.4	57.2	23.8	.9	1.7	1.8	1.2	100.0
NEVADA	.4	80.8	15.0	.1	2.6	.4	.7	100.0
NEW MEXICO	3.1	69.5	25.6	-	.6	1.0	.2	100.0
OREGON	9.2	37.5	48.8	.2	1.9	1.2	1.2	100.0
UTAH	4.2	46.9	36.2	.5	9.0	.2	3.0	100.0
WASHINGTON	19.1	19.7	53.0	2.0	2.2	2.1	1.9	100.0
WYOMING	3.9	76.0	15.6	3.0	.3	.3	.9	100.0
WESTWIDE	8.6	53.7	32.4	.8	2.5	1.1	.9	100.0

Cropland

Land area in cropland varies from less than 3 percent in the arid Lower Colorado and closed Great Basin Regions to more than 15 percent in the higher rainfall areas.

The 65,129,000 acres of cropland are land tilled for field crops, rotational hay and pasture, cover and soil improvement crops, summer fallow, and land in fruit and nut orchards, in bush foods, berries and similar fruit crops. It includes formerly tilled land that has not purposely been converted to another use.

Almost two-thirds of the cropland in the West is used to produce livestock or livestock products. There are large acreages of hay and feed grain in all regions. Irrigated pasture occupies large acreages in every region except the Lower Colorado.

Vegetables are grown on about 6 percent of the cropland. The remainder of the cropland is divided about equally among food crops (wheat, rice, sugar beets and potatoes are the most important); fruit and nuts, and oil, fiber and seed (mostly cotton, safflower and alfalfa seed).

Range and Grassland

Range and Grassland cover over half of the Westwide area. It is the dominant vegetative cover in eight of the 11 Western States and covers over two-thirds of Nevada, Wyoming, New Mexico and Arizona.

The 407,824,000 acres of range and grassland are land permanently used for forage, including wild hay, mountain meadows and native pastures. Both pastureland and hayland comprise grassland. Grass and forbs, northern desert shrub, southern desert shrub, and salt desert shrub are the types of range. Plant cover consists principally of native grasses, forbs and shrubs, valuable for forage.

Forest

Forests cover nearly one-third of the Westwide area. They cover half the states of Washington and Oregon and share with range and grassland as dominant vegetative cover in California and Idaho.

The 245,890,000 acres of forest are land at least 10 percent stocked by forest trees of any size capable of producing timber or other wood products or capable of influencing the water regime. Many genera of trees are found including cottonwood, maple, oak, pine, spruce, fir, juniper and redwood.

Alpine

With the exception of Mount Washington in New Hampshire, all alpine areas in the continental United States are on the Rocky, Cascade and Sierra Mountains. Even in the West, it comprised less than 1 percent of the land area. Only in the States of Wyoming, Colorado and Washington does it comprise over 2 percent of the states' surface.

The 5,951,000 acres of alpine occur on elevated slopes and in glaciated basins above timberline elevations. The severe climatic conditions at the high elevations (from about 5,000 in the north to 12,000 feet MSL in the south) limit vegetal growth. Fragile plant communities are extremely slow to recuperate following disturbance. More commonly found alpine plant species include sedges, bluegrass, gentian, willows, and bluebells. Shale, rock slides, snow fields and glaciers are found in the alpine barren areas.

Other

The 18,782,000 acres of other land are land not classified as cropland, range or grassland, forest, alpine, or urban and built-up areas. This category consists of other farm land including farmsteads, farm roads, feedlots, fence and hedgerows, rural residences, non-vegetal cover on military installations, landfills, wetlands, barren lands such as salt flats, rock exposures, dunes and beaches, and miscellaneous lands. Utah substantially exceeds the 2.5 percent of Westwide state surface area categorized as other. This is due to the salt flats.

Urban

Over half of Westwide's 33.7 million people reside in metropolitan areas with populations exceeding a million; i.e., Los Angeles, San Francisco, Seattle, San Diego and Denver. Another 8 million live in cities of 100 thousand to a million. The remaining 2.6 million urban people live in cities and towns of less than 100 thousand, scattered throughout the 11 Western States.

The 8,549,000 acres of urban and built-up areas are lands in cities, villages and built-up areas of more than ten acres, institutional industrial and commercial sites, roads, railroads, airports, cemeteries, golf courses and parks within urban boundaries.

Water

Water accounts for about 1 percent of the Westwide surface area. The 8,009,000 acres are permanent inland water surface areas such as lakes, reservoirs, ponds and streams, sloughs, estuaries, canals, indented embayments and sounds, and other coastal waters behind or sheltered by headlands or islands separated by less than one nautical mile of water. It excludes 220,000 acres of Pacific coastal waters (excluding Hawaii and Alaska) under jurisdiction of the United States.

Water areas were divided into two categories according to size of bodies of water. An area of 1,037,000 acres is in ponds and lakes of not more than 40 acres and rivers and streams that are less than 1/8 mile wide. The remaining 6,972,000 acres are in lakes, ponds and reservoirs at normal pool elevation having over 1,000 acres and rivers over 1/8 mile wide.

SELECTED USES FOR THE PRODUCTION OF FOOD, FIBER AND WOOD PRODUCTS

Man makes use of the land to conduct his activities. He lives, works, plays and pursues human interests on, under or over the land. Data on his activities are base factors in planning for wise land use and management.

Among the problems involved in collecting data on man's activities are classification of type and intensity, uses not obvious to the observer, and several uses concurrently being made on the same parcel of land. For example, an area covered with trees may provide surroundings for a camper, hiker, birdwatcher or hunter; any of these recreationalists may use the area at varying intensities. Rangelands' dominant use may be space holding communities apart to retain individual identity, or to provide a restful ride to the commuter; the rangelands' value for greenbelt or open space is not as obvious to many observers as its value for cattle grazing. A cropland area may provide upland game habitat as well as be used for food production.

Land used for the production of food, fiber and wood products are the selected uses shown in Table 5. There are many other uses such as mineral extraction, recreation, hunting and fishing, water production, utilities, transportation systems, and urban. We have not attempted to show these uses in this table. Other selected uses may be covered in a later addition to this Working Document.

The significance of these other uses is that any change in present use of land affects the use of that land for other uses. For instance, the construction of a super highway or expansion of a town into prime agricultural or timber producing lands eliminates use of these irreplaceable lands for food and fiber production. This results in the development of less productive lands in an effort to continue to produce needed food and fiber. This same action may drastically affect fish and wildlife habitat or create flooding problems which, in turn, will affect additional uses of the land.

Each and every use of land must be carefully studied to evaluate the total effect on <u>all</u> uses of land and water resources.

Irrigated Land

Water is applied by artificial means on 23,740,000 acres of cropland and 7,145,000 acres of grassland. The means vary from intensively managed irrigation systems on specialty crops to water spreading on native grassland.

The Westwide figures are generally slightly higher than census irrigated cropland and than state total irrigated area as shown in the 1972 OBERS. Variations in estimated acreage cannot totally be accounted for. It is probably due partly to definition and partly to measurement

TABLE 5

WESTWIDE SELECTED LAND USES BY REGION BY STATE

(1,000 acres)

Region and State	Production of Food, Fiber, and Wood Products: Irrigated Cropland: Row	Irrigated Cropland: Non-Row*	Irrigated: Grassland**	Irrigated: Total	Dry Cropland: Row	Dry Cropland: Non-Row*	Grazing Use	Timber: Public	Timber: Private
COLUMBIA-NORTH PACIFIC									
Washington	215	1,237	256	1,708	51	6,801	13,458	10,105	9,255
Oregon	271	1,422	85	1,778	32	3,623	32,912	14,935	9,040
Idaho	999	2,275	251	3,525	1	2,714	30,856	12,722	3,121
Montana	7	59	364	430	-	186	4,936	7,653	2,800
Wyoming	-	66	28	94	-	22	1,300	670	30
Nevada	-	7	61	68	-	-	3,118	17	4
Utah	-	7	-	7	-	1	230	5	-
TOTAL	1,492	5,073	1,045	7,610	84	13,347	86,810	46,107	24,250
CALIFORNIA									
California	1,066	7,722	1,551	10,339	-	1,571	44,249	8,370	7,130
Oregon	10	299	164	473	-	43	741	1,687	982
TOTAL	1,076	8,021	1,715	10,812	-	1,614	44,990	10,057	8,112
MISSOURI									
Montana (incl. Hudson Bay)	119	508	1,159	1,786	26	11,724	55,343	4,807	2,118
Wyoming	222	802	228	1,252	8	1,060	37,000	1,000	190
Colorado	710	128	323	1,161	81	5,466	7,341	1,411	719
TOTAL	1,051	1,438	1,710	4,199	115	18,250	99,684	7,218	3,027
GREAT BASIN									
Idaho	20	174	53	247	-	433	1,362	14	1
Wyoming	-	40	19	59	-	9	800	80	-
Nevada	9	266	532	807	-	-	45,030	46	69
Utah	75	980	269	1,324	-	641	18,700	1,495	426
TOTAL	104	1,460	873	2,437	-	1,083	65,892	1,635	496
UPPER COLORADO									
Wyoming	-	170	162	332	-	13	12,000	350	30
Utah	13	265	30	308	-	277	33,624	1,269	360
Arizona	2	9	-	11	-	-	3,131	-	98
Colorado	75	157	682	914	124	575	5,799	9,142	3,133
New Mexico	24	1	28	53	1	11	5,888	95	272
TOTAL	114	602	902	1,618	125	876	60,442	10,856	3,893
LOWER COLORADO									
Nevada	4	14	24	42	-	-	5,773	13	-
Utah	17	7	-	24	-	-	9,769	13	32
Arizona	594	1,035	32	1,661	14	-	53,261	2,666	1,213
New Mexico	29	7	6	42	1	35	7,346	758	64
TOTAL	644	1,063	62	1,769	15	35	76,149	3,474	1,309
RIO GRANDE									
Colorado	69	125	377	571	-	-	1,279	1,800	421
New Mexico	289	203	146	638	27	244	38,658	2,849	1,194
TOTAL	358	328	523	1,209	27	244	39,937	4,649	1,615
ARKANSAS-WHITE-RED									
Colorado	337	103	270	710	141	2,778	10,000	1,561	650
New Mexico	85	41	30	156	105	423	9,402	136	900
TOTAL	422	144	300	866	246	3,201	19,402	1,697	1,550
TEXAS GULF									
New Mexico	256	94	15	365	150	425	2,435	-	-
WESTWIDE TOTAL	5,517	18,223	7,145	30,885	762	39,075	495,741	85,693	44,252
ARIZONA	596	1,044	32	1,672	14	-	56,392	2,666	1,311
CALIFORNIA	1,066	7,722	1,551	10,339	-	1,571	44,249	8,370	7,130
COLORADO	1,191	513	1,652	3,356	346	8,819	24,419	13,914	4,923
IDAHO	1,019	2,449	304	3,772	1	3,147	32,218	12,736	3,122
MONTANA	126	567	1,523	2,216	26	11,910	60,279	12,460	4,918
NEVADA	13	287	617	917	-	-	53,921	76	73
NEW MEXICO	683	346	225	1,254	284	1,138	63,729	3,838	2,430
OREGON	281	1,721	249	2,251	32	3,666	33,653	16,622	10,022
UTAH	105	1,259	299	1,663	-	919	62,323	2,806	818
WASHINGTON	215	1,237	256	1,708	51	6,801	13,458	10,105	9,255
WYOMING	222	1,078	437	1,737	8	1,104	51,100	2,100	250

* Small Grain, Rotational Hay and Pasture, Specialized Crops, and Unharvested Cropland, Irrigated and Dry, respectively.
**Range and Permanent Pastureland and Hayland.

Base Year 1965 - See text.

(May 1973)

TABLE 6

COMPARISON OF DATA FOR IRRIGATED LAND
(1,000 acres)

State	Table C-13, OBERS 1972 Projections: 1969 Census Irrigated Area	Table C-13, OBERS 1972 Projections: Total Irrigated Area	Table 5 Westwide: Irrigated Cropland	Table 5 Westwide: Total Irrigated Land
Arizona	1,167	1,211	1,640	1,672
California	6,896	8,500	8,788	10,339
Colorado	2,653	(3,356)	1,704	3,356
Idaho	2,655	3,564	3,468	3,772
Montana	1,679	3,250	693	2,216
Nevada	626	979	300	917
New Mexico	795	1,016	1,029	1,254
Oregon	1,395	2,073	2,002	2,251
Utah	924	1,183	1,364	1,663
Washington	1,199	1,495	1,452	1,708
Wyoming	1,367	2,000	1,300	1,737
WESTWIDE	21,356	28,627	23,740	30,885

procedures. When comparing the data in Table 6, note that census and CNI include hayland-permanent grass cover harvested as hay - as cropland; Westwide includes hayland as grassland. It is believed Westwide irrigated acreages are larger because they are for the total land dedicated to

TABLE 7

IRRIGATED CROPLAND HARVESTED
(1,000 acres)

State	1964 Crops: Feed	1964 Crops: Food	1964 Crops: Other	Total: 1964 All Farms	Total: 1969 Class 1 to 5 Farms
Arizona	520	171	397	1,006	1,029
California	2,605	3,056	937	6,437	6,195
Colorado	1,621	411	13	2,044	2,175
Idaho	1,219	856	63	2,239	2,219
Montana	1,192	180	12	1,380	1,371
Nevada	466	25	13	503	495
New Mexico	406	82	200	688	622
Oregon	793	228	49	1,086	1,071
Utah	644	109	38	769	679
Washington	407	440	66	909	993
Wyoming	979	121	5	1,103	1,093
WESTWIDE	10,852	5,679	1,793	18,164	17,942

1/ Total acreage for Feed, Food and Other Crops may exceed Total 1964 All Farms because of double cropping. Cropland used only for pasture or grazing is excluded.

SOURCE: 1972 OBERS Projections, Vol. 5, Table 6
1969 Census of Agriculture

irrigation whether or not it was irrigated in any given year. Irrigated cropland comprises 37 percent of the total cropland. About half of the harvested cropland acreage was irrigated.

The 7,145,000 acres of irrigated grassland may yield several times per acre the forage on non-irrigated grassland. It often complements the feed crops and range and dry pastureland and hayland in supporting stable livestock enterprizes.

Dry Cropland and Grassland

An estimated 18,810,000 acres or about half of the non-irrigated cropland were harvested. The unharvested dry cropland includes cropland used solely for pasture or grazing, summer fallow, soil building crops, planted acreages not harvested, and formerly cropped land that has not yet changed use.

TABLE 8

NON-IRRIGATED CROPLAND HARVESTED, 1964

(1,000 acres)

State	Feed Crops	Food Crops	Other Crops	Non-Irrigated Cropland Harvested
Arizona	16	2	3	20
California	988	328	241	1,409
Colorado	968	1,584	144	2,682
Idaho	734	861	101	1,696
Montana	2,682	3,672	123	6,433
Nevada	4	25	0	4
New Mexico	102	92	34	218
Oregon	812	879	270	1,965
Utah	96	171	9	270
Washington	1,164	2,291	91	3,514
Wyoming	380	218	7	599
WESTWIDE	7,946	10,123	1,023	18,810

SOURCE: 1972 OBERS Projections, Vol. 5, Table 6

Range and dry glassland are the most extensively used for food production. The use of these acres is perhaps the largest single factor contributing to the Western cultural image.

Value of Crop Production

Crops grown on the 37.5 million acres of harvested cropland are shown in Table 9. Value of this crop production in 1964 and valued at 1967 prices was $3,371.2 million. Value of the United States crop production in the same year and prices was $17,170.9 million.

TABLE 9

ACRES OF CROPS HARVESTED BY STATE, 1967

(1,000 acres*)

State	Food Crops: Wheat	Rye	Rice	Citrus	Non-Citrus**	Vege-tables	Sugar Beets	Pota-toes	Peas & Beans
Arizona	50.0	-	-	30.0	26.6	74.1	11.6	10.9	-
California	349.8	-	360.0	189.6	1,375.0	706.5	201.2	110.4	1.9
Colorado	1,940.2	12.0	-	-	19.4	28.4	127.6	46.4	179.0
Idaho	1,299.1	8.0	-	-	19.6	40.0	147.1	304.3	191.0
Montana	4,727.6	5.0	-	-	2.4	1.5	57.2	8.4	8.0
Nevada	18.0	-	-	-	.2	-	-	.7	-
New Mexico	141.0	-	-	-	18.8	13.2	-	3.1	4.0
Oregon	1,046.0	16.0	-	-	130.0	142.6	19.5	49.1	9.0
Utah	279.0	-	-	-	15.8	9.9	25.3	7.7	9.0
Washington	2,925.0	16.0	-	-	153.6	185.1	47.6	64.0	125.0
Wyoming	310.3	14.0	-	-	.02	1.8	51.1	3.4	38.0
Westwide	13,086.0	71.0	360.0	219.6	1,761.4	1,203.1	688.2	608.4	564.9

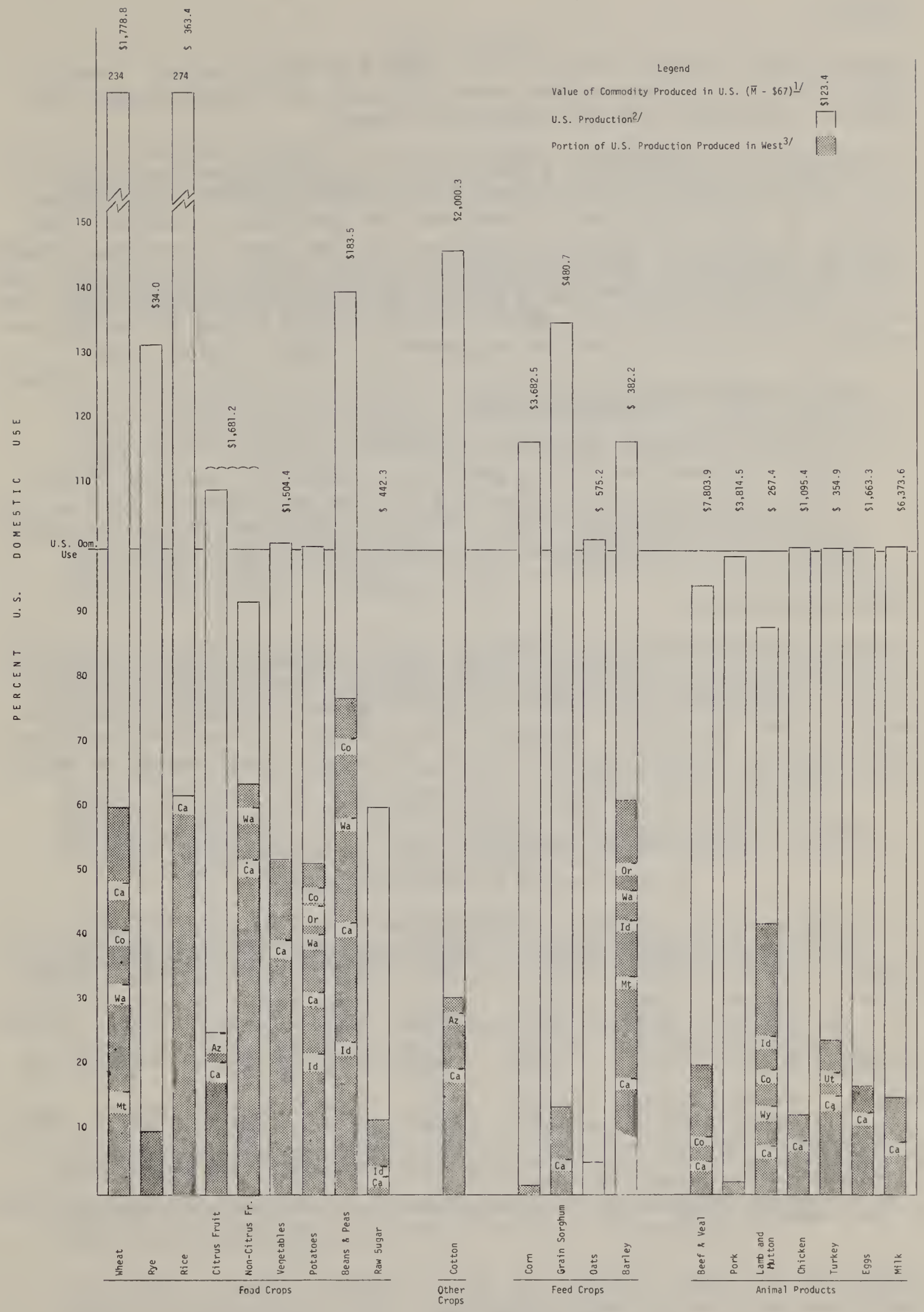
State	Feed Crops: Corn	Silage	Sorghum	Oats	Barley	Hay	Other Crops: Flax	Peanuts	Cotton
Arizona	22.0	15.0	246.0	-	160.0	232.8	-	-	255.9
California	224.0	126.1	424.0	85.0	1,450.0	1,894.8	1.0		613.9
Colorado	271.0	455.6	345.0	60.0	237.0	1,483.3	-	-	-
Idaho	24.0	57.0	-	62.0	529.0	1,321.7	-	-	-
Montana	19.0	50.0	-	140.0	1,255.0	2,370.6	5.0	-	-
Nevada	-	6.0	-	1.0	17.0	410.6	-	-	2.3
New Mexico	17.0	124.0	314.0	-	16.0	269.7		8.0	126.8
Oregon	12.0	22.0	-	94.0	266.0	1,139.7	-	-	-
Utah	-	43.0	-	21.0	125.0	582.2	-	-	-
Washington	20.0	34.0	-	37.0	226.0	875.0	-	-	-
Wyoming	24.0	32.0	-	92.0	96.0	1,223.9	-	-	-
WESTWIDE	633.0	964.7	1,329.0	592.0	4,377.0	11,804.3	6.0	8.0	998.9

* Acreages less than 500 acres are indicated with (-) dash.
**Acres of non-citrus are totals rather than acres harvested from 1967 CNI Data.

SOURCE: Unpublished OBERS Agricultural Base Data - December 1, 1971

FIGURE 5

PRODUCTION AND VALUE OF AGRICULTURAL COMMODITIES



SOURCE: 1/ 1972 OBERS Projections, Volume 5, United States Table 5.
2/ Computed from 1972 OBERS Projections, Volume 1, Table C-3.
3/ Computed from unpublished OBERS Agricultural Base Data - December 1, 1971, Natural Resource Division of Economic Research Service, USDA.

Grazing

Domesticated livestock and wildlife graze 495,741,000 acres. Herbivorous animals can graze as they roam rotational and permanent pastures, meadows, rangeland, and non-commercial forest.

Grazing use is an essential element in the production of meat products (wildlife grazing will be considered in another section of the report). Grazing is largely confined to pastures and grasslands; however, some grazing is also carried on in forest and alpine areas. The use of alpine areas for grazing is decreasing because of the critical soil-vegetation-stabilization factors and, to a certain extent, conflict with other uses such as wilderness and recreation. These changes in use are being compensated for by more intensive management of other grazing areas.

Value of Livestock Production

Livestock pastured 9.5 million acres of cropland. They also grazed improved and native grassland, rangeland, and some forest land. Value of western livestock in 1964 and valued at 1967 prices was $2,762.6 million. Value of the United States livestock production in the same year and prices was $21,373.1 million.

Timber Production

Timber as considered here is limited to the commercial forest land which is that forest land capable of producing wood fiber in economic quantities on a sustained yield basis without undue soil disturbance or impairment of other land uses. Because of the critical soil-water-vegetative relationships, these commercial forest lands are irreplaceable in this study area.

TABLE 11

OUTPUT OF TIMBER PRODUCTS FOR THE UNITED STATES AND WESTERN REGION[1/]

By Source of Material and Softwoods and Hardwoods[2/]

(1,000 cubic feet)

Products	Species Group	Total Output: United States	Western Region	Douglas-Fir	Ponderosa Pine	California	No. Rocky Mountain	So. Rocky Mountain
Saw Logs:	Softwoods	4,957,481	3,371,900	1,438,985	471,562	751,789	549,699	159,865
	Hardwoods	1,355,458	43,193	35,040	1,620	5,520	50	963
Veneer Logs and Bolts:	Softwoods	1,000,587	741,562	531,138	69,452	67,862	67,682	5,428
	Hardwoods	125,644	1,702	1,546	0	138	18	0
Pulpwood:	Softwoods	4,285,407	1,319,319	982,880	30,698	124,962	136,900	33,879
	Hardwoods	1,325,740	33,449	29,474	0	3,975	0	0

1/ Includes Hawaii and Black Hills area of South Dakota. Volumes not available at this printing, but not felt significant for purposes of this report.

2/ Data extracted from "Forest Statistics for the United States by State and Region, 1970," published by USDA, Forest Service, 1972.

Production of timber products for the 11 Western States is shown in comparison with the national production. It is interesting to note that approximately 75 percent of softwood saw logs and veneer come from western forests.

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